UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/086,363 | 03/04/2002 | Takashi Hashimoto | 027260-518 | 2704 |

7590 09/09/2005

Platon N. Mandros
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, VA 22313-1404

| EXAMINER | |
|---|---|
| FUREMAN, JARED | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2876 | |

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/086,363 | HASHIMOTO ET AL. | |
| | Examiner | Art Unit | |
| | Jared J. Fureman | 2876 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14-16* is/are allowed.

6)☒ Claim(s) *1-6 and 9-13* is/are rejected.

7)☒ Claim(s) *7 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

Receipt is acknowledged of the amendment, on 6/24/2005, which has been entered in the file. Claims 1-16 are pending.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Chamberlain et al (US 6,411,746 B1, cited by Applicants).

Chamberlain et al teaches an optical fiber holding device, comprising: an optical fiber (12) having a grating (see column 3, lines 54-59); a strip-shaped member having a rectilinear groove (metal layer 18, see figures 3 and 4) in which the optical fiber is accommodated, a gap formed between a wall surface of the rectilinear groove and the optical fiber (the region between the metal layer 18 and the optical fiber device 12, see column 5, lines 17-20), and a gel substance (see column 5, lines 18-20) contacting with the optical fiber and filled in the gap; and a substrate (32) on which the optical fiber and the strip-shaped member are mounted (see figures 3 and 4); wherein the optical fiber is not contacted with a wall surface of the groove of the strip-shaped member (the region between the metal layer 18 and the optical fiber 12 is filled with the gel, see column 5

lines 18-20); wherein the gel substance includes a silicon compound (see column 5, lines 18-20, in that organic/inorganic material naturally includes silicon); (also see figures 3, 4, column 1 lines 5-13, 35-59, column 2 lines 3-6, column 3 lines 50-64, column 4 lines 27-32, column 4 line 54 - column 5 line 24).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Chamberlain et al.

The admitted prior art teaches an optical fiber holding device, comprising: an optical fiber (1) having a grating (2); a heater (3) for heating the grating to a predetermined temperature distribution; a substrate (4) on which the optical fiber and the heater are mounted; wherein the optical fiber is contacted with the heater (see figures 14, 15, and page 1 line 15 - page 3 line 31, of the specification).

The admitted prior art fails to specifically teach a strip-shaped member, having a rectilinear groove in which the optical fiber is accommodated, a gap formed between a wall surface of the rectilinear groove and the optical fiber, and a gel substance contacting with the optical fiber and filled in the gap; wherein the optical fiber is not contacted with a wall surface of the groove of the strip-shaped member; wherein the gel

substance includes a silicon compound; wherein the strip-shaped member is made of quartz.

Chamberlain et al teaches an optical fiber holding device, comprising: an optical fiber (12) having a grating (see column 3, lines 54-59); a strip-shaped member (metal layer 18 and substrate 32, see figures 3 and 4), having a rectilinear groove in which the optical fiber is accommodated (see figures 3 and 4), a gap formed between a wall surface of the rectilinear groove and the optical fiber (the region between the metal layer 18 and the optical fiber device 12, see column 5, lines 17-20), and a gel (see column 5, lines 18-20) substance contacting with the optical fiber and filled in the gap; wherein the optical fiber is not contacted with a wall surface of the groove of the strip-shaped member (the region between the metal layer 18 and the optical fiber 12 is filled with the gel, see column 5 lines 18-20); wherein the gel substance includes a silicon compound (see column 5, lines 18-20, in that organic/inorganic material naturally includes silicon); wherein the strip-shaped member is made of quartz (the substrate 32 may be silica, glass, or another material, see column 4 lines 57-58, thus suggesting quartz); (also see figures 3, 4, column 1 lines 5-13, 35-59, column 2 lines 3-6, column 3 lines 50-64, column 4 lines 27-32, column 4 line 54 - column 5 line 24).

In view of Chamberlain et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the admitted prior art, a strip-shaped member, having a rectilinear groove in which the optical fiber is accommodated, a gap formed between a wall surface of the rectilinear groove and the optical fiber, and a gel substance contacting with the optical fiber and filled in the gap;

wherein the optical fiber is not contacted with a wall surface of the groove of the strip-shaped member; wherein the gel substance includes a silicon compound; wherein the strip-shaped member is made of quartz, in order to provide greater protection of the optical fiber and also greater heat control.

5. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art as modified by Chamberlain et al in view of Lauzon et al (US 5,671,307, cited by applicant).

Re claim 6: The teachings of the admitted prior art as modified by Chamberlain et al have been discussed above.

The admitted prior art as modified by Chamberlain et al fails to specifically teach a Peltier element for keeping a temperature level of the predetermined temperature distribution of the grating at a predetermined level; and a temperature sensor for detecting the temperature of the optical fiber used to control the Peltier element.

Lauzon et al teaches an optical fiber holding device, including: an optical fiber (1) having a grating (2); and a Peltier element (6, 7, 10, and 11) for keeping a temperature level of the predetermined temperature distribution of the grating at a predetermined level; and a temperature sensor (thermistor 22 and thermoelectric control unit 24) for detecting the temperature of the optical fiber used to control the Peltier element (see figure 1 and column 2 line 48 - column 3 line 38).

In view of Lauzon et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system as taught by the admitted prior art as modified by Chamberlain et al, a Peltier element for keeping a

temperature level of the predetermined temperature distribution of the grating at a predetermined level; and a temperature sensor for detecting the temperature of the optical fiber used to control the Peltier element, in order to provide accurate control of the heater.

Re claim 13: The teachings of the admitted prior art as modified by Chamberlain et al and Lauzon et al have been discussed above. The system as taught by the admitted prior art as modified by Chamberlain et al and Lauzon et al necessarily includes optical circuitry for inputting an optical signal to the grating and for outputting the optical signal reflected on the grating, since each of the inventions as taught by the admitted prior art, Chamberlain et al, and Lauzon et al is designed to be used with optical circuitry.

***Allowable Subject Matter***

6. Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 14-16 have been allowed over the prior art of record.

8. The following is a statement of reasons for the indication of allowable subject matter (Re claims 7 and 8) and the reasons for allowance (Re claims 14-16): The prior art of record, taken alone or in combination, fails to teach or fairly suggest the substrate including a positioning mark which is used for positioning the strip-shaped member on the substrate; a method of manufacturing an optical fiber holding device as recited in claims 14-16. Specifically, re claim 14: the steps of filling the gel substance in the

groove or the strip-shaped member; accommodating the optical fiber in the groove of the strip-shaped member in which the gel substance is filled; mounting the strip-shaped member in which the gel substance is filled and the optical fiber is accommodated on the substrate on which the heater is mounted; and moving the strip-shaped member on the substrate so as to carry out a positioning of the groove with respect to the heater; re claim 15: the steps of securing the strip-shaped member on the substrate on which the heater is mounted; filling the gel substance in the groove of he strip-shaped member secured on the substrate; inserting and accommodating the optical fiber in the groove of the strip-shaped member in which the gel substance is filled; and moving the optical fiber on the heater so as to carry out a positioning of the grating with respect to the heater; and re claim 16: the steps of mounting the optical fiber on the heater which is mounted on the substrate; coating the optical fiber mounted on the heater with a gel substance; mounting the step-shaped member on the substrate and accommodating the optical fiber in the groove of the strip-shaped member; and moving the strip-shaped member on the substrate so as to carry out a positioning of the grating with respect to the heater.

While the admitted prior art teaches adjusting the optical fiber relative to the heater using positioning marks (see page 1, line 28 - page 2, line 20 of the specification), without the benefit of applicant's teaching, there is no motivation for one of ordinary skill in the art at the time of the invention to combine the prior art of record in a manner so as to create the claimed invention.

***Response to Arguments***

9. Applicant's arguments filed 6/24/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that Chamberlain et al does not disclose a gel substance; the material produced by the sol-gel process is not the same as the gel substance recited in the claims; the glass or glass-ceramic material produced by the sol-gel process is a hard material, in contrast to the claim which recited a gel material which is a soft material (see pages 10-11, of the amendment filed on 6/24/2005), Chamberlain et al teaches "The slotted tubular heater when used for a long period grating packaging provides a reservoir area for putting the sol gel or polymer material in, until it can be thermally cured around long-period grating." (see column 2, lines 6-9), and "... the region between the metal layer 18 and the optical fiber device 12 is filled with a hybrid organic/inorganic, glass or glass-ceramic material produced by a sol gel process." (see column 5, lines 17-20). Thus, Chamberlain et al teaches that the sol gel may not only be a glass or glass-ceramic material, but may also be other hybrid organic/inorganic materials. Furthermore, the sol gel as taught by Chamberlain et al will be a soft material when applied, before curing. Thus, the definition of sol-gel glass is only partially relevant. Applicant's claims merely recite "gel substance", which is clearly not limited to the example given in applicant's specification, but includes any material that can be considered a "gel substance". Thus, the claims do not require the gel substance to be a soft material or remain a soft material indefinitely after being applied, since there are many "gel substances" which have different properties. The general

dictionary definition (according to the McGraw-Hill Encyclopedia of Science & Technology Online) of a gel is a two-phase colloidal system consisting of a solid and a liquid in more solid form than a sol. Since a sol gel is a material that transforms from a sol to a gel, the sol gel material as taught by Chamberlain et al can be considered a "gel substance". Therefore, Chamberlain et al meets the claimed limitation of "gel substance".

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Liu et al (US 2002/0186954 A1) teaches a fiber optical array in which optical fibers are bonded within V-grooves using a sol-gel (see, for example, paragraphs 7 and 11).

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared J. Fureman whose telephone number is (571) 272-2391. The examiner can normally be reached on 7:00 am - 4:30 PM M-T, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jared J. Fureman
Primary Examiner
Art Unit 2876

September 1, 2005